Study Reinitiation

• Rescoping

• Received an exemption from 3x3x3

• Study reinitiated on January 21, 2014
Study Status

• Developed and Screened the Initial Array of Measures and Alternatives to a Focused Array
• Developed technical scopes of work
  • AdH
  • Delft3D
  • EwE
  • CASM
• Alternative Milestone is October 27th
  • Concurrence from VT on Focused Array and Path Forward to TSP
Identifying Measures and Alternatives

• Local Sponsor requested inclusion of Louisiana 2012 State Master Plan (SMP) “Final Array” of alternatives that use the MR as a sediment resource.

• PDT also brainstormed to consider new ideas.

• The measures and initial array of alternatives included the same operating plans/locations/assumptions as was evaluated in the Master Plan.

• The PDT will evaluate these assumptions further using refined models to select a TSP.
LCA Mississippi River Delta Management Study Initial Array of Measures/Alternatives

**Measures**

**Sediment Diversions**
1. Central Wetlands (5,000 cfs)
2. Upper Breton (250,000 cfs)
3. Mid-Breton Sound Sediment Diversion (6,000 cfs)
4. White Pit Diversion (55,000 cfs)
5. Lower Breton (30,000 cfs)
6. Lower Barataria (50,000 cfs)
7. Bayou Lafourche (1,000 cfs)

**Marsh Creation**
- South Lake Ewa Marsh Creation (203 acres)
- Lake Borgne - Component A (1,697 acres)
- New Orleans East Land Bridge (6,598 acres) (some construction activity outside of MRDM)
- Central West side Component A (2,037 acres)
- Golden Triangle Marsh Creation (2,468 acres)
- Honore (652 acres)
- Pipeline Conveyance Marsh Creation, Barataria Basin (10,240 acres) (some construction activity outside of MRDM)
- Barataria Bay-Rim Marsh Creation (1,912 acres)
- Breton Sound Rim Marsh Creation (TBD)

**Add Ons (Can be added to individual measures or alternative)**
- Sediment Trap in River
- Closure of Passes
- Channelizing Lower River
- Sediment Retention Terraces
- Barrier Islands
- Beneficial Use of Diversion Inundated Shoaled Material
- Sensitivity to Dredging, revegetation, salt water sill
- Channel Realignment
- Outilt Management Dredging to Maintain Divers on Performance

**Initial Array of Alternative Plans**

1. Sediment Diversions Only (1d-7d)
2. Sediment Divisions and Marsh Creation (1d-7d and 1m-9m)
3. Marsh Creation Only (1m-9m)
4. Upper and Middle Sediment Divisions Only (1d, 2d, 3d, 4d, 7d)
5. Lower Sediment Division Only (5d, 6d)
6. Combinations of diversions and marsh creation
7. Scaling Intensity, Duration and Timing of Dredging Operations
Initial Screening Criteria

• Objective Criteria
  • Acres created
  • Habitat Diversity (salinity shifts and HSIs)

• Constraint Criteria
  • River Impacts – sediment/dredging volume changes, stage decreases or increases, total water volume removed.
  • Basin Flooding Impacts – stage differences
Methods and Models

- 2012 Louisiana State Master Plan Model Output
  - Acres, HSIs, Salinities, Basin Stage
- Hydrodynamic Study 1D River Models
  - Stage, Sediment/Dredging Volume Changes
- Analytic Methods and New AdH (screening level)
  - Acres, Salinities, Stage
- Existing LCA Models
  - White Ditch, Myrtle Grove
    - Salinities, Stage
Lower Barataria: Land  Moderate Scenario
(FWP - FWOP for Land / Water, 30 m grid)

Year 25

Year 50

*Lower Barataria - 002.D1.15 - G14 Model Group includes other projects
Month-Averaged Salinity: June

Run3: Upper Breton Sound

Without Project
Water Surface Elevation Impacts

Run6: Lower Barataria and Lower Breton
Screened Measures/Plans

• Diversions
  • Upper Breton Sound Diversion screened (moved to future implementation) based on basin flooding and habitat diversity impacts.
  • Central Wetlands screened based on basin flooding, and low acres.

• Marsh Creation
  • Barataria Bay Rim and Breton Rim screened because of SLR impacts, and sustainability.
  • Hopedale screened because of low acres, least benefit to system and land locked.
  • Lake Borgne, NO East, and Golden Triangle were screened because of proximity to diversion influence areas.
Pertinent Screening Information

• New Marsh creation sites were added in the same footprint as diversion land building.

• The team will make direct comparisons of diversions to marsh creation keeping as many variables constant as possible (including the sediment resource/bar in the river).

• Outfall management add ons will be included in sensitivity analysis of the focused array of alternatives to optimize diversion performance.

• Diversion induced shoaled material will be utilized for outfall management/marsh creation.
## LCA Mississippi River Delta Management Study Focused Array of Measures/Alternatives

### Measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5d</td>
<td>Mid-Breton Sound Sediment Diversion (5,000 - 15,000 cfs)</td>
</tr>
<tr>
<td>6d</td>
<td>Lower Breton (50,000 cfs)</td>
</tr>
<tr>
<td>6d</td>
<td>Lower Barataria (50,000 cfs)</td>
</tr>
</tbody>
</table>

### Marsh Creation

- Pipeline Conveyance Marsh Creation, Barataria Basin
- New Marsh Creation Sites to Compare to Diversion

### Add Ons - Features to Optimize Performance (Can be added to individual measures or alternative plans)

- Closure of Passes (Fort St. Philip)
- Channelizing Lower River
- Sediment Retention (marsh creation, rams, terraces, SREDs, islands, reefs, etc.) sediment source is river shoaling, bars, or outfall management dredging to maintain diversion performance
- Use of Maintenance Dredging
- Beneficial Use of Diversion Induced Shoaled Material
- Sensitivity to Dredging, invasions, saltwater still

### Focused Array of Alternative Plans

1. Middle and Lower Sediment Diversions (5d, 6d, 6c) w/Sediment Retention Add On (4d) and sensitivity to other Add Ons
2. Dredge Only Marsh Creation (from river channel bars) (10m)
3. Lower Diversions (6d, 6c) w/Sediment Retention Add On (4d) and sensitivity to other Add Ons
4. Future Without Project (with and without Mid Barataria) (a FWP may be added including Mid Barataria)

### Future Without Project - tentative until impacts are evaluated

- Mid-Barataria Diversion (75,000 cfs - 1st increment)
Screening of Focused Array to a TSP

Developing the Science

- 2 multidimensional numerical models addressing local and system-wide hydrodynamics, salinity, sediment dynamics, morphological characteristics, nutrient dynamics, and ecosystem dynamics.
  - AdH/SEDLIB – 2D depth-averaged mode with quasi 3D sediment behavior.
    - Primary Productivity Model included in SEDLIB
    - Simplified Box Model for water quality constituents
  - Delft 3D
    - Data Collection
      - Marsh Elevation, Bathymetry, Meteorological, Stage, Temperature, Velocities, Chlorophyll a, DO, Salinity, Turbidity, Above and Below Ground Biomass/Soil Organic Matter/Mineral Sediment Content/Soil Strength
    - Developing a Wetland Soil Model Component
    - Nutrient Dynamic and Morphodynamic Module
Screening of Focused Array to a TSP

Developing the Science

• 2 Ecological (primarily fisheries) Models
  – Ecopath with Ecosim (EwE)
    • Open source ecosystem modeling software, originally developed by Polovina (1984) to model trophic interactions and to estimate mean annual biomass of the French Frigate Shoal coral reef ecosystem.
    • These models are Mass-balanced (Ecopath), time-dynamic (Ecosim) and spatially explicit (Ecospace)
  – Comprehensive Aquatic System Model (CASM)
    • Determine effects of large scale river diversions and other project features on economically and ecologically important fish and shellfish species in Pontchartrain and Barataria Basins.
Delta Management Milestones

- FCSA Signed 24 Aug 2011
- National Planning Charette 15-19 Oct 2012
- Waiver Approved 29 Jul 2013
- Develop Initial Array of Alternatives 24 Apr 2014
- Screen Initial Array of Alternatives 15 Aug 2014
- Alternatives Milestone IPR #1 15 Oct 2014
- Tentatively Selected Plan Milestone Meeting #2 19 Aug 2015
- Agency Decision Milestone Meeting #3 25 Mar 2016
- Final Report Submittal 04 Jul 2016
- Civil Works Review Board #4 16 Sep 2016
- Chief’s Report Milestone #5 16 Dec 2016
Questions?